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AN AQUEOUS SOLUTION OF ETHYLENE DICHLORIDE FOR FUMIGATION OF JAPANESE BEETLE LARVAE IN SOIL

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The effectiveness of an emulsible mixture of ethylene dichloride for the control of immature stages of the Japanese beetle has recently been reported by Mason, Chisholm, and Burgess (2)[1/]. Infested plant material and soil were treated with 1 gallon of mixture per 100 gallons of water, either by dipping or by surface application, and this treatment was authorized (3) and has been used extensively as a basis of certification of infested plant material under the Japanese beetle quarantine.

The preparation of the diluted mixture involved the making of an emulsion from the specified emulsible mixture and a small quantity of water, which was then diluted with the remainder of the water. Since the emulsible mixture contains a fatty-acid soap, some difficulty has been encountered in a few cases in the making of uniform dilutions owing to the hardness of the only available water. This condition was indicated by the formation of curdy material in the diluted mixture. A method of preparation has been found which overcomes this objectionable feature.

Since soaps of the nature of that used in the authorized mixture are converted to water-insoluble compounds by hard water, attention was directed to other surface-active agents, a large number of which had been described by Cupples (1). These compounds in general overcome the principal disadvantages of fatty-acid soaps. A preparation manufactured by the Atlas Powder Company and described by the company as a polyoxyalkylene derivative of sorbitan monolaurate is soluble in ethylene dichloride and in water.

[1/] Underscored figures in parentheses refer to Literature Cited, p. 2.

An emulsible mixture prepared by dissolving 2-1/2 pounds of Tween 20, as this product is called, in 97-1/2 pounds of ethylene dichloride (approximately 1/4-pound of Tween 20 per gallon of mixture) makes a clear product that will withstand low temperatures, and may be diluted uniformly with hard water.

It is diluted for use in the following manner: One volume of the emulsible mixture is dispersed by vigorous shaking with an equal volume of water in a closed container for about 1 minute. The resulting uniform emulsion is then diluted at the rate of 1 gallon of this mixture to 200 gallons of water and stirred gently for a few minutes. If the final dilution contains less than enough ethylene dichloride to saturate the water a substantially clear solution will result. If more than enough ethylene dichloride is used the excess will collect on the bottom of the container and may be ignored.

This emulsible mixture in aqueous solution has been successfully used for the control of Japanese beetle larvae. In this dilution the ethylene dichloride content is about the same as that of the diluted mixture previously authorized, and comparative tests have shown it to be at least as effective. Since the active ingredient is in solution, maximum penetration is obtained in soil masses. The use of the aqueous solution here described is now authorized as a Japanese beetle quarantine treatment (4).

Emulsible mixtures containing other liquid fumigants such as dichlorethyl ether or dichloropropane-dichloropropylene (DD mixture) have been prepared in a similar manner using Tween 20. Emulsions and aqueous solutions may be prepared from these mixtures as described above, and may be used for the control of various insects.

LITERATURE CITED

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